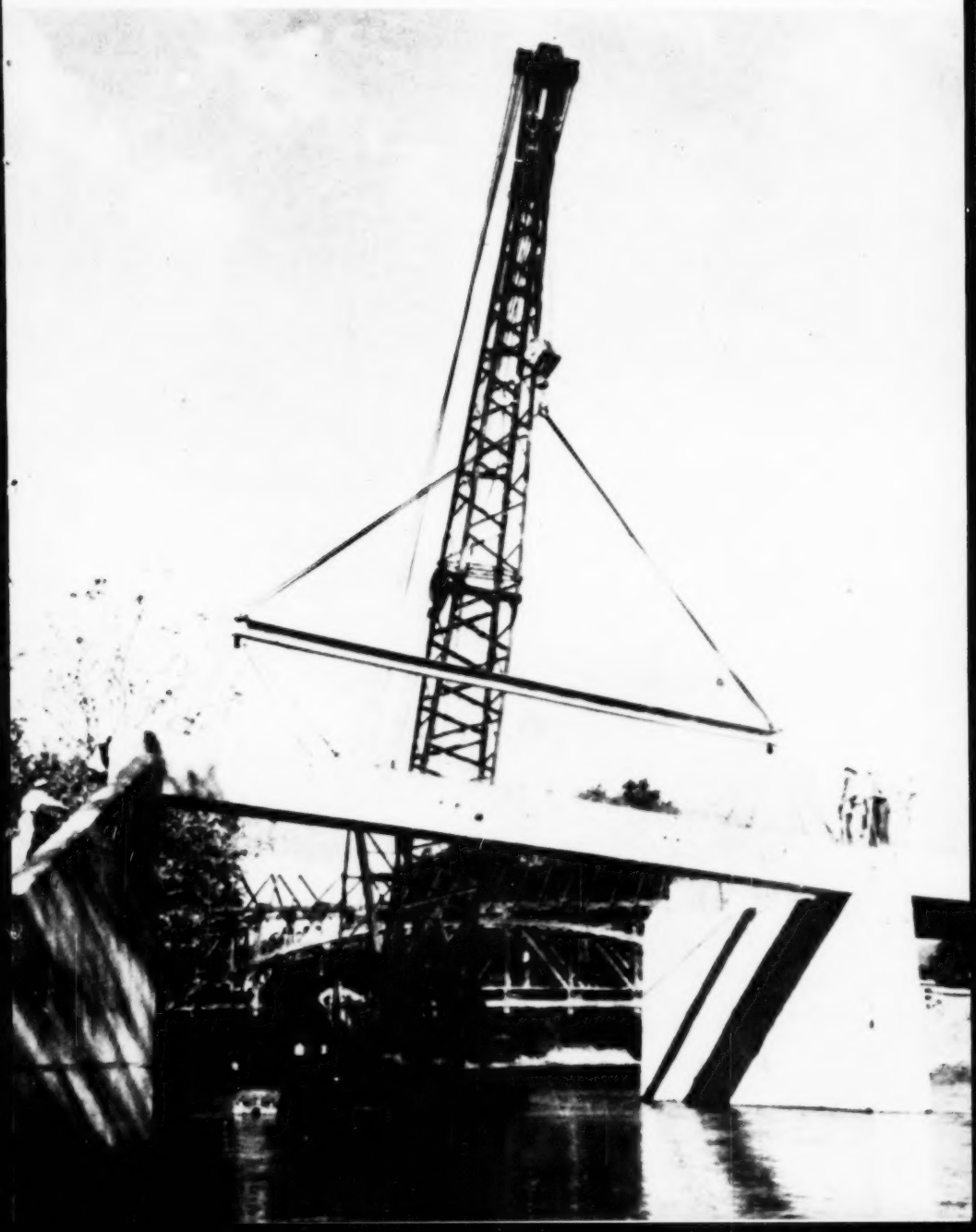
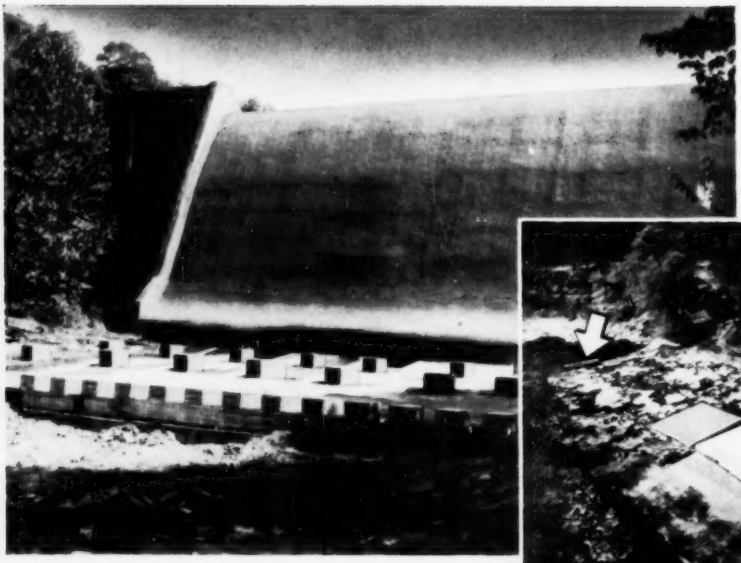
ACI News Letter

Vol. 24, No. 6 JOURNAL of the AMERICAN CONCRETE INSTITUTE February 1953





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Spillway apron at the Gorge Dam of the Ohio Edison Co. after repair operations by Prepakt. Photo (right) shows destructive effect of 1952 floods with slabs ripped loose and moved downstream.

PREPAKT CONVERTS FLOOD DAMAGE INTO MODERN SPILLWAY APRON

Last year, spring floods damaged the spillway apron at the Ohio Edison Company's Gorge Dam at Cuyahoga Falls, Ohio. Torrents of water undermined, dislodged and cracked the 75-ton concrete apron slabs.

The apron, located at the bottom of a gorge, was inaccessible by road. This posed some difficult restoration problems until Prepakt simplified the job.

Prepakt methods made use of existing slabs and consisted of (1) removing loose materials, (2) building required forms, (3) placing aggregate and (4) pumping Intrusion mortar. Aggregate was delivered by gravity chutes and mortar was pumped from the top of the gorge.

The improved apron as rebuilt by Prepakt incorporates permanent anchors in bedrock, baffles to absorb the destructive power of the water and a toe wall to prevent undercutting of the apron.

* * *

It has been proved that low-shrinkage Prepakt Concrete provides a high-strength permanent bond to existing concrete. Old concrete is fully incorporated into the complete monolithic structure, producing important savings in quantities of new concrete required.

Detailed information on this or any other Prepakt application may be had by writing or calling the Main Office, Cleveland, Ohio.

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ACI

News Letter Contents

February 1953

On the Cover—Placement of hollow prestressed precast girders, 53 ft long, 36 in. wide, 33 in. deep, in the five-span highway bridge near Glenlron, Pa. (see "Precast Concrete in Highway Bridge Construction," p. 565).

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Concrete industry meets new challenges

Although prestressed concrete has received a great deal of attention from the engineering profession in recent months, it is well to remember that all phases of concrete technology have been advancing at an almost equal pace. Precast concrete, with and without prestressing, is finding many uses in varied types of structures and has been cast in shapes never before thought possible. Shell construction has continued to gain prominence, resulting in some rather spectacular structures described in this month's JOURNAL.

In conjunction with the development of new techniques in concrete construction and advancement and perfection of old ones, the concrete industry has applied advantageously products developed in other fields and normally associated with anything but concrete construction.

Plastic molds

For example, modern plastics, which have been used in everything from raincoats to automobile bodies, have now been put to a new use—as molds for thin-shell precast concrete panels.

After experimenting with various types of molds—wood, metal, plaster, and concrete—molds made of glass fabric and plastic were chosen for a West Coast project as meeting the requirements of durability, light weight, and ease of repair.

The basic unit of plastic pan was approximately 4 x 4 ft. Two ounces of Fiberglas mat and one layer of Fiberglas cloth per square foot were used in these molds. The center of the form was reinforced for attachment of a special hydraulic release mechanism, used in separating the molds from the concrete panels. Besides light weight and durability, another advantage of the plastic molds was their elasticity, which aided in stripping the forms from the concrete casting.

Not only has the concrete industry found new uses for concrete and developed new techniques, but the ever-changing picture of science and industrial technology, as well as the nation's changing

Continued on p. 4

Continued from p. 3

economy, has opened new vistas and presented new problems for the concrete technologist and engineer. It is impossible to enumerate all factors and to illustrate all the problems solved or the possibilities offered, but several have received recent prominence.

Concrete to withstand jet blasts

Development of the jet aircraft engine is changing not only the future of aviation, but also affecting many tangential fields, including the concrete industry. Aircraft engines require testing during development and production. Such tests are normally conducted within concrete structures, comprising—among other components—an exhaust stack, which serves to attenuate the engine roar and direct the exhaust gases skyward. Since jet engines can raise the temperature within the structure from room temperature to 1200 F in eight seconds, special refractory concretes are needed to withstand the deteriorating effects of heat, temperature shock, and cycling.

Durable structural-refractory lightweight concrete has been developed using aluminous cements and artificial aggregates. Aggregates manufactured by sintering or burning in a kiln certain types of clay or shale to cause expansion are the most dependable. In-place cost of the concrete has varied in the current market from $155 to $205 per cu yd.

Concrete for radiation shielding

Perhaps even greater possibilities of progress have been offered to mankind with the advent of the nuclear energy industry, which in itself presents new demands on the concrete technologist.

Large-scale production of penetrating radiation and radioactive materials, as a result of the use of nuclear reactors, particle accelerators, industrial radiography, and X- and gamma-ray therapy entails the use of shielding material for the protection of operating personnel against the biological hazards of such radiation. The primary factor involved in radiation shielding is the reduction of the intensity of the radiation to the desired level. Secondary to this are economic and mechanical factors.

Almost any material will serve for shielding purposes if sufficient thickness is used. However, the use of materials requiring excessive thicknesses may be precluded on an economic basis; other materials requiring only moderate thicknesses may not be practical for economic or mechanical reasons. Thus, although water is a good neutron shield, it requires excessive thicknesses for shielding accompanying gamma-radiation, and water tanks are relatively fragile. At the other extreme, lead shields are very effective against gamma-radiation, but lack mechanical strength for large, permanent shielding structures.

Concrete is an effective, versatile, and economic material for permanent shielding installations. It possesses good compromise thickness requirements for both neutron and gamma-ray attenuation, sufficient mechanical strength, low maintenance, and reasonable cost. While ordinary concrete in sufficient thickness will provide satisfactory shielding, heavy concrete, made from special aggregates with a generally higher unit cost, is often preferable due to smaller thickness requirements. Heavy aggregates, such as limonite, magnetite, barite, and even scrap iron, have been used successfully. Because of the reduction in shielding thickness, and attendant space saving, for large shields, heavy concrete is competitive with ordinary concrete, in spite of the difference in unit cost of the concrete alone.

Limitless boundaries

Science has as yet recognized no limit to progress. With the discovery of new materials and development of new products and techniques, our industrial economy will continue to expand. Such expansion is bound to create new types of structures and even more uses for concrete. For example, space travel, once considered beyond the realm of man, is now considered a distinct possibility. What material could be more appropriate for construction of giant rocket launching platforms than concrete? There are, of course, certain limitations on what concrete can do, but the future seems to offer almost unlimited possibilities.

Safety Council course

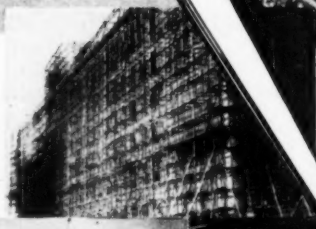
The 1953 sessions of the National Safety Council's Safety Training Institute held a five-day course on the fundamentals of industrial safety, February 16-20.

Protex

All Over The World It's Protex For Leadership in Construction

San Juan Housing Project, Puerto Rico
This new housing project, constructed on filled-in-marsh-land, used Protex air entrainment for easier placement and better surface texture.

Fuji Bank Bldg., Tokyo, Japan
Economy in this new bank building was realized in initial cost, time and labor, with Protex concrete.



Hungry Horse Dam, Montana
This one project contains over 3 million cubic yards of Protex concrete. Protex was selected because of its consistent quality and proven economy.

Rio Lempa Dam, El Salvador
This giant state-sponsored project used Protex air entraining agent for high quality concrete under normally unfavorable labor and climatic conditions.

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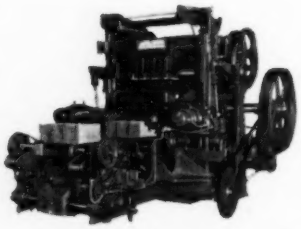
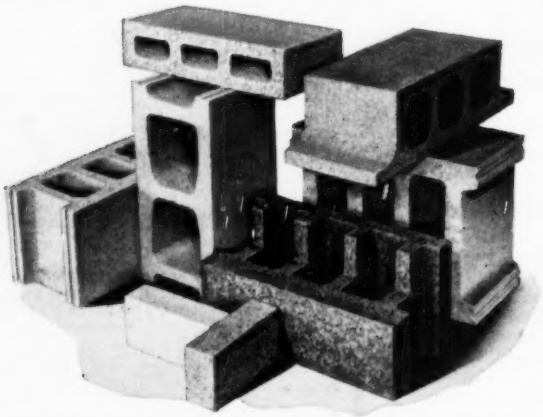


Front Pallet Feed Vibrapac

The fully automatic block machine. One man removes finished block with power off-bearing hoist, and, with no lost motion, returns empty pallets to Vibrapac.



(Left) Just a few of the many types and sizes of block made on a Besser Vibrapac machine. Only ONE set of Plain Pallets required for ALL types and sizes.

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Army engineers use *ACI Inspection Manual*

The Lower Mississippi Valley Div., Corps of Engineers, holds training courses for concrete inspectors. The courses, after three years of development, are credited with measurably improving the quality of concrete going into flood control and navigation structures built under the division's supervision.

Established in 1950 by Brig. Gen. Peter A. Feringa, division engineer and president, Mississippi River Commission, as a supplement to on-the-job training, the course was intended both for new inspectors and to give refresher instruction to the older men. General Feringa made attendance mandatory for each man who performs inspection of any phase of concrete manufacture.

The course is comprised of a series of lectures and laboratory classes followed by a written examination. Texts consist of a mimeographed outline of the several sessions, the *ACI Manual of Concrete Inspection*, and a field edition of the Waterways Experiment Station *Handbook of Concrete and Cement*. The sessions cover proportioning of concrete mixtures, placement procedures, aggregate sampling and testing, and inspection procedures as set forth in the ACI Manual.

Clore succeeds Gosswein

Robert H. Clore, technical service engineer at Chicago, for Universal Atlas Cement Co., was appointed technical service manager, to succeed O. H. Gosswein who retired after more than 35 years with the company.

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Oesterreichischer Betontag 1953

The "Oesterreichischer Betontag 1953," which will take place on March 23-24, in Vienna, Austria, will honor Dr. Rudolf Saliger.

Rogers and Snitoff form partnership

Paul Rogers and Howard J. Snitoff, registered structural engineers, Chicago, Ill., recently formed the partnership of Rogers and Snitoff, Inc., with headquarters in Chicago.

ENTRAINED AIR METER

A portable, light-weight device for measuring air in concrete. Based on design of Washington State Highway Dept.

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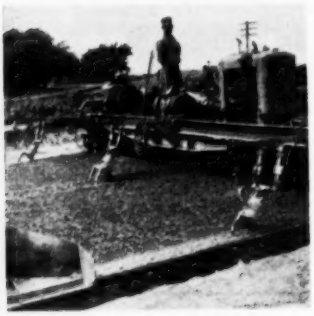

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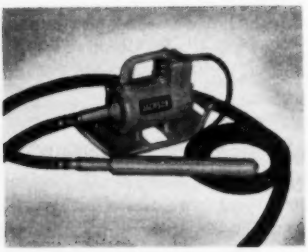

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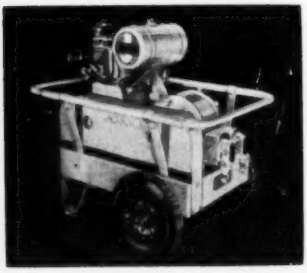

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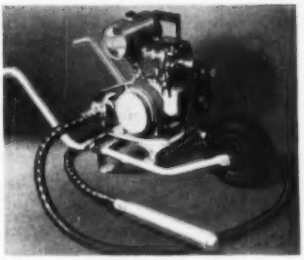

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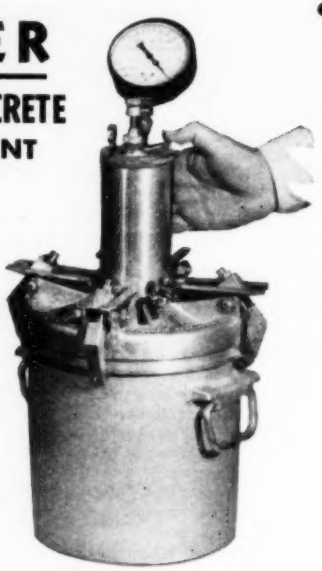

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Master Builders Co. elects officers

Election of S. W. Flesheim to chairmanship of the board, and of E. L. McFalls as president was announced recently by The Master Builders Co., Cleveland, Ohio. B. R. Wood was elected vice-president in charge of merchandising. E. W. Scripture, Jr., was re-elected vice-president of research and chief of operations. Vernon S. Andrews was appointed industrial sales manager.

A founder of the company in 1909, Mr. Flesheim has been president since 1914. Mr. McFalls, who joined the company in 1922, has been executive vice-president since 1940.

Richardson forms partnership

George S. Richardson, Pittsburgh, Pa., in addition to continuing his individual consulting engineering practice, has formed a new partnership, Richardson, Morehouse, Ramsey and Fisher. The new firm is presently engaged in work for the Ohio Turnpike.

Who's Who This Month

Anton Tedesko

Anton Tedesko, author of "Construction Aspects of Thin-Shell Structures," p. 505, is manager of the structures department, Roberts and Schaefer Co., Chicago, Ill.

After general design and construction experience with several firms, such as Mississippi Valley Structural Steel Co., and Dyckerhoff and Widmann (Germany), he joined the Roberts and Schaefer Co. in 1932, progressively working as designer, construction engineer, and design manager. During World War II he was engineer-manager of Roberts and Schaefer's Washington office.

Mr. Tedesko was among the first to use movable wheel-mounted centerings to lower the cost of industrial concrete structures. His name is associated with the design and construction supervision of the Hershey Sports Arena, the San Diego Seaplane Hangar, and more recently with an Air Force hangar of 340 ft span.

He studied engineering in Austria at the University of Vienna Institute of Technology where he received his degree of CE and, more recently, a degree of Doctor of Engineering.

Mr. Tedesko is a member of ACI, ASCE, and AREA.

Charles S. Whitney

Charles S. Whitney, consulting engineer, Ammann and Whitney, New York and Milwaukee, is the author of "Reinforced Concrete Thin-Shell Construction," p. 521. As a member of the partnership of Ammann and Whitney, he has been engaged in the design of buildings, airport facilities and bridges, including structures on the New Jersey Turnpike and expressways in Milwaukee, Wis.

He received a CE degree from Cornell University in 1914 and his MCE in 1915 from the same school. Following graduation he held positions with Gustav Lindenthal; John Parkinson, architect; A. C. Eschweiler, architect; and Hool and Johnson, engineers. From 1922 to date he has been a consulting and designing engineer.

Mr. Whitney has been an ACI member since 1920 and is chairman of ACI Committee 312, Plain and Reinforced Concrete Arches; ACI-ASCE Joint Committee 327, Shear and Diagonal Tension, as well as being a member of Committee 214, Evaluation of Results of Compression Tests of Field Concrete; and ACI-ASCE Joint Committee 327, Ultimate Load Design.

Honors to Mr. Whitney are many, including the ACI Wason Medal for the most meritorious paper in 1932, "Plain and Reinforced Concrete Arches," the Alfred E. Lindau Award in 1951 "in recognition of his many contributions to reinforced concrete design practice"; the Fuertes Graduate Medal of Cornell University twice; and the ASCE J. James R. Croes Medal.

Pier Luigi Nervi

"Precast Concrete Offers New Possibilities for Design of Shell Structures," p. 537, by Pier Luigi Nervi, was presented at ACI's fall regional meeting.

Dr. Nervi, partner in the engineer-architect firm, Nervi-Bartoli, Rome, Italy, teaches architecture at the University of Rome. One of the world's most brilliant engineers, Dr. Nervi's designs in reinforced concrete and steel include huge hangars, stadia, exhibition halls, ships and aquaducts.

In October, 1950, he lectured at the University of Buenos Aires in Argentina and received an honorary degree of Doctor of Architecture. Dr. Nervi has been commissioned as one of a team of three outstanding architects to design the new UNESCO building in Paris, France.

Hermann Craemer

Hermann Craemer, professor of civil engineering, University of Alexandria, Egypt, describes "Design of Prismatic Shells," p. 549.

For several years Dr. Craemer was lecturer at Darmstadt and was professor of civil engineering at the National Academy of Architecture, Weimar, Germany, from 1937-1940. He taught reinforced concrete at the

Continued on p. 13

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Who's Who

Continued from p. 11

Technical University, Graz, Austria, 1940-1946. For two years he was scientific adviser to the Yuogoslav Ministry of Works. Since 1949 he has been teaching the theory of structures at the University of Alexandria.

In 1919 he received a degree in civil engineering at Dantzig, became *doctor-ingenieur* in 1923, and *doctor-ingenieur-habil* in 1930. From 1920-1937 Dr. Craemer worked for Philipp Holzmann, Dyckerhoff and Widmann, and the Reichsautobahn (National Motor Roads).

At the present time he is engaged with problems on plasticity and with the probabilistic approach to structural problems.

Eric L. Erickson

"Precast Concrete in Highway Bridge Construction," p. 565, is written by Eric L. Erickson, chief, Bridge Branch, Bureau of Public Roads, Washington, D. C.

Mr. Erickson entered the service of the Bureau in 1941 and prior to his becoming chief in 1948, he was assistant chief in the Bridge Branch. Previous to his Washington assignment he served as a bridge engineer in the division office in Montgomery, Ala.

Before entering the service of the Bureau of Public Roads, Mr. Erickson was assistant state bridge engineer for the Louisiana Department of Highways for about 18 years in which position he supervised the design and construction of many large bridges built in Louisiana. This work included bridges over the Chef Menteur and Rigolets Passes, the Red River, the Ouichita River, Atchafalaya and Mississippi Rivers.

S. D. Lash

S. D. Lash, professor of civil engineering, Queen's University, Kingston, Ontario, Canada, considers "Ultimate Strength and Cracking Resistance of Lightly Reinforced Beams," p. 573.

Dr. Lash graduated from the City and Guilds College, University of London, England, in 1928. During 1929 and 1930 he gained experience in reinforced concrete design offices in Canada and returned to England in 1931. In 1933 he was awarded a PhD

Continued on p. 15

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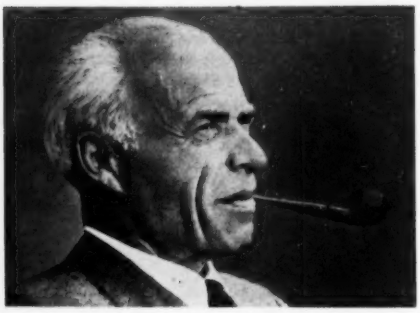
Franz Dischinger

Prof. Franz Dischinger died in Berlin, Germany, January 9, 1953. He studied engineering at Karlsruhe and started his practical engineering career by joining Dyckerhoff and Widmann, a firm well known for its pioneering work in reinforced concrete.

During the middle 30's, while a technical director of Dyckerhoff and Widmann, he accepted an appointment to the University of Berlin as professor of reinforced concrete construction. There, his teaching activities left him time for research and for consulting work. His name is connected with much outstanding engineering construction undertaken in central Europe during the past 15 years.



Professor Dischinger built his first prestressed concrete bridge in 1927, and built a bold arch bridge over the Moselle river in 1933. His theory for the design of deep girders was published in 1932; his exact theory of cylindrical shells in 1935; and his classic work on the buckling stability and deformations of arches, both elastic and inelastic, in 1939. His latest book on reinforced concrete construction (1949) is part of the German *Taschenbuch for Bauingenieure*. Some of his recent publications were on the design of dams and suspension bridges.

Professor Dischinger's outstanding engineering talent and creative work were recognized by institutions and universities, which awarded him many prizes and several honorary degrees of doctor of engineering. The Franklin Institute of the State of Pennsylvania gave him the Longstreth Medal.

He was an expert in pneumatic foundations, concrete shell domes, arch bridges, prestressing, etc., on which subjects he made outstanding contributions. He worked relentlessly with great energy and enthusiasm throughout his life.

Boyd E. Phelps

Boyd E. Phelps, president, Boyd E. Phelps, Inc., Michigan City, Ind., died December 9, 1952. The engineering firm which he headed designed the Norman Beatty Memorial Hospital at Westville, Ind. Other jobs handled by his firm were the Crane Naval Ammunition Depot, Evansville waterworks, Michigan City water system, and more than a million dollars worth of bridges in Marion County, Ind.

Mr. Phelps had been an ACI member since 1950.

Abeles visits U. S.

Paul W. Abeles, consulting engineer and lecturer on prestressed concrete for graduates at Brixton School of Building, London, England, visited the United States from November 6 to December 6, 1952, and took part in the Western Conference on Prestressed Concrete, arranged by the University of California at Los Angeles, by presenting a paper on "Prestressed Concrete Design and Construction Practices in England."

During his stay in this country Dr. Abeles lectured on prestressed concrete at Massachusetts Institute of Technology, Lehigh University, California Institute of Technology, University of California, University of Illinois, Western Society of Engineers (arranged by the Illinois Institute of Technology jointly with Northwestern University), Stevens Institute of Technology, and University of Michigan. Most of these lectures were arranged by Martin Mahler, consultant, Union, N. J., who is promoting the study of prestressed concrete at colleges in the United States.

Vezina appointed purchasing agent

The Inland Lime and Stone Co., Gulliver, Mich., has appointed Paul W. Vezina purchasing agent to succeed A. L. Lavigne who will retire this year.

Who's Who

Continued from p. 13

degree by the University of Birmingham. He stayed at Birmingham two years as research assistant to the Steel Structures Research Committee.

Returning to Canada in 1935, Dr. Lash held appointments at the University of British Columbia and the National Research Council, Ottawa. At Ottawa he was technical secretary to the National Building Code Committee. Dr. Lash moved to Queen's University in 1941. In addition to concrete and reinforced concrete he is interested in city and regional planning and is at present spending a sabbatical year in England studying practice in this field.

Stephen Revesz

Stephen Revesz, structural engineer, Birmingham, England, author of "Behavior of Composite T-Beams with Prestressed and Unprestressed Reinforcement," p. 585, presently is engaged in the design of reinforced concrete structures. His main interest lies in the field of prestressed concrete in which he has been carrying out experimental work.

Subsequent to two and one-half years in the bridge office of the Southern Region, British Railways, he worked under Dr. Hajnal-Konyi on shell-roofed structures and industrial buildings, and for two years was resident engineer on a warehouse project.

In 1945 Mr. Revesz graduated from London University with a BS degree and received an MS degree from the Imperial College of Science and Technology in 1952.

Spears appointed PCA district engineer

Ralph E. Spears has been appointed district engineer of the Salt Lake City, Utah, office of the Portland Cement Assn.

Mr. Spears is a graduate of Iowa State College, where he received a BS degree in architectural engineering in 1941. After graduation he was employed for two and one-half years as a structural engineer with the American Bridge Co., Gary, Ind. From 1944 to 1946 he served in the U. S. Navy as a salvage officer in the Pacific theater.

Mr. Spears joined PCA in 1948 as district structural engineer of its St. Louis office. He is a member of ACI, ASCE, and a registered professional engineer in Missouri.

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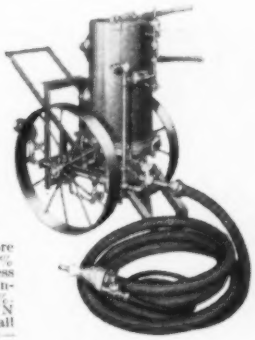

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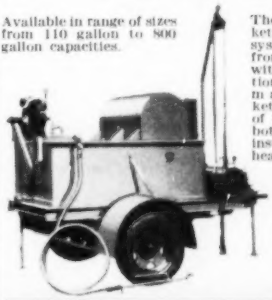

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Membership in the American Concrete Institute

If this issue of the ACI JOURNAL has been of interest and useful in your work and you are not already a member, assure yourself of receiving it regularly by completing and sending in the membership application form below. The grades of membership are described overleaf.

All who have an interest in concrete and a desire to improve it through a nonprofit educational service in gathering, correlating, and disseminating information on design, construction, manufacture, use, and maintenance of concrete structures and products are eligible for Institute membership.

There are many opportunities in the Institute for technical committee activity, contributions from your experience in technical papers and the briefer "Letters from Readers" section, and in reviewing technical literature. Thus you can help further ACI's aim "to provide a comradeship in finding the best ways to do concrete work of all kinds and in spreading that knowledge," and at the same time benefit from the experiences of other Members.

(cut here)

Board of Direction, American Concrete Institute
18263 W. McNichols Road
Detroit 19, Michigan

Date _____

Individual Members, North America and U. S. Possessions	**$15.00**
Individual Members elsewhere	**12.00**
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Of the annual dues, $12.00 is for the JOURNAL of the American Concrete Institute (except that dues for Junior and Student Members apply in full for the JOURNAL).

The undersigned hereby applies for _____ **membership**
(Individual, Corporation, Contributing, Junior, Student)

in the American Concrete Institute. Proposed by _____

For Corporation Membership, ACI representative will be _____

_____ (Date of graduation if Student)

_____ (Name, if Corporation)

Signature _____

For our records, please complete both sides of application.

EXCERPTS FROM BYLAWS: ARTICLE I—MEMBERS

Section 1. This Institute shall consist of Members, Corporation Members, Contributing Members, Junior Members, Student Members and Honorary Members interested in furthering the Institute's objects as set forth in its Charter.

Sec. 2. A Member shall be an individual.

A Corporation Member shall be a firm, corporation, society, agency of government or other organization. A Corporation Member shall name one individual as its representative who will enjoy all membership rights and privileges.

A Contributing Member shall be an individual, firm, corporation, society, agency of government or other organization wishing to give larger support to Institute activities through the payment of larger dues. Contributing Members, other than individuals, shall name representatives as do Corporation Members.

A Junior Member shall be a person less than 28 years old.

A Student Member shall be less than 28 years old and a student in residence at a recognized technical or engineering school.

An Honorary Member shall be a person of eminence in the field of the Institute's interest, or one who has performed extraordinarily meritorious service to the Institute.

Sec. 3. All classes of Members except Honorary Members and Student Members, shall be proposed by at least one Member of the Institute and elected by a two-thirds vote of the Board of Direction. An Honorary Member shall be elected by unanimous vote of the Board of Direction. A Student Member shall be proposed by a member of his school's faculty, who need not be a Member of the Institute, and elected by a two-thirds vote of the Board of Direction.

Sec. 4. All Members shall have all rights and privileges of membership as determined by the Board of Direction except that a Junior or Student Member shall not vote nor hold office. The status of a Student Member shall change automatically to that of Junior Member on the first anniversary of his membership succeeding the date on which he ceases to be a student in residence. The status of a Junior Member shall be changed to that of Member on the first anniversary of his membership after he becomes 28 years of age.

Sec. 5. Applications for and resignations from Membership and requests for change of representatives of Corporation or Contributing Memberships shall be presented in writing to the Secretary-Treasurer. Resignations may be accepted only from Members whose dues are not more than 60 days in arrears, except by special action of the Board of Direction.

(cut here)

Date of Birth _____
Month Day Year

Title or Position _____

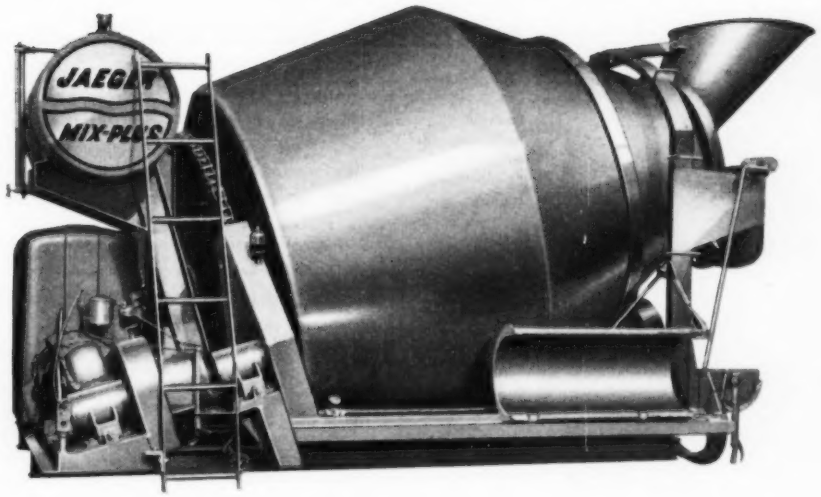
Name of Firm or Organization _____

☐ **Business Address** _____

☐ **Resident Address** _____
(Please check address to which you wish mail and publications sent)

Nature of Firm's Business _____

Good concrete construction calls for properly mixed concrete . . .



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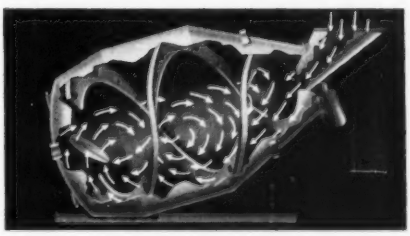

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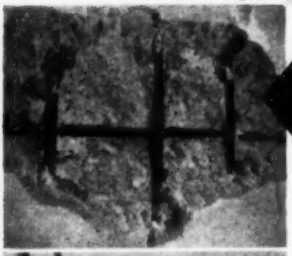

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Construction outlook for 1953

Construction activity this year is expected to reach a new peak, perhaps rising about $1 billion over the $32⅓ billion apparent for 1952, according to outlook estimates prepared jointly by the U. S. Labor Department's Bureau of Labor Statistics and the Building Materials Div., U. S. Department of Commerce.

The outlook for record construction in 1953 assumes that business will remain good, buoyed in part by increasing expenditures, at least in the early part of the year. It was assumed also that materials would be plentiful, limited controls in force would not interrupt construction operations, labor supply would be adequate, and that costs would remain relatively stable.

This year, a new peak in expenditures is anticipated, supported by a continuing high level of housing activity and expansion in public utility plant and commercial building. About as many private dwelling units are expected to be started this year as in 1952, when the million-unit mark will again be exceeded.

This year is expected to be the tenth in succession of increasing construction activity by public utilities. Most of the rise in volume will occur in the gas and electric light and power group for which an extensive backlog of both industrial and domestic need exists.

Commercial building activity will probably jump by over a fourth in 1953, continuing the recovery evident in recent months as a result of improved materials availability and removal of credit controls. On the other hand private industrial building is expected to drop by about the same proportion as defense plant expansion programs approach completion.

Highway construction will probably reach a new high this year—nearly ten percent above 1952's level, reflecting the expanding program of Federal aid to highway building, and an anticipated large volume of state toll road construction. Ground has already been broken for the $300 million Ohio Turnpike project, and work is proceeding rapidly on the $500 million New York State Thruway.

Continued on p. 26

New Members

The Board of Direction approved 41 Individual, 2 Corporation, 9 Junior and 21 Student Members for January. With adjustments for losses—resignations and non-payment of dues—the total membership was 5972 on January 1.

Individual

ANDREWS, A. L., Lower Hutt, N. Z. (Civil & Struct. Engr.)
BOLDEN, DAVID I., Manhattan, Kans. (Instr., Kans. State College)
BRETTELL, I. P., Toronto, Canada (Genl. Mgr., The Cooksville Co., Ltd.)
CARBRAY, PAUL A., Montreal, Canada (Dist. Mgr., Sika Chemical Corp.)
CHAMBERLIN, WILBUR H., Denver, Colo. (Testing, USBR)
CHANDLER, E. H., Lake Charles, La. (Area Supervisor, Pittsburgh Testing Lab.)
CONSTANTINE, PHOEBUS, Limassol, Cyprus (Asst. Engr., Titan Constr. & Engrg. Co.)
COOK, HENRY E., Ottumwa, Ia. (Engr.)
CRINNION, EDWARD V., Tampa, Fla. (Struct. Engr., Nathan Grout, Struct. Engr.)
DAVIES, J. H., Long Beach, Calif. (Cons. Engr.)
ECKBERG, ADRIAN E., Boston, Mass. (Charles T. Main, Inc.)
FLUSS, PAUL J., San Francisco, Calif. (Testing Engr., Board of State Harbor Comm.)
GILLERAN, JOHN J., Somerville, N. J. (Development Engr., Johns-Manville Corp.)
HARTER, CHARLES W., Portland, Ore. (Struct. Engr., Leslie E. Poole, Engr.)
JONES, R. B., Montreal, Canada (Genl. Mgr., Charles Warnock & Co., Ltd.)
KILLINS, DAVID A., Ann Arbor, Mich. (Concrete sales, Genl. Super., Killins Gravel Co.)
KIRK, DAVID G., Alton, Ill. (Designer, Fluor Corp., Ltd.)
LEE, DONOVAN H., London, England (Cons. Engr.)
LOW, RICHARD A., Ottawa, Canada (Chief Design Engr., Trans-Canada Highway Div., Dept. of Resources & Development)
LU, SHAW H. Y., Jamaica, N. Y. (Design, D. B. Steinman, Cons. Engr.)
LYON, W. M., Lexington, Ky. (Engr., Contr., Ky. Geological Engrg. Co.)
MARTINEZ ELISSAGUE, JOSE, Mexico, Mexico (C. E.)
MCCAIN, O. L., Tucson, Ariz.
MCMINN, LEON, Greensboro, N. C. (Sr. Partner, McMinn & Norfleet, Archs.)
MCMURTIE, G. E., Calgary, Canada (Field Engr., Master Builders Co., Ltd.)
MORRIS, S. S., Cape Town, S. Africa (City Engr., City of Cape Town)
MULLER, CARLOS L., Caracas, Venezuela (Genl. Mgr., Mixto Listo Ca.)
NAUSCH, LEOPOLD K., Cape Town, S. Africa (Sr. Designer, Reinforcing & Struct. Engrg. Co., Ltd.)
NELSON, DAVID H., Baltimore, Md. (Sr. Struct. Engr., Green Assocs., Inc.)
NEWMAN, H. J., La Oroya, Peru (Concrete Tech., Ebasco Services, Inc.)
NOLTON, STEWART S., JR., San Gabriel, Calif. (Sales Engr., Consolidated Rock Products Co.)
RANDLE, STANLEY G., O'Fallon, Ill. (Service Engr., Marquette Cement Mfg. Co.)
ROUSSO, AHARON, Tel-Aviv, Israel (Partner, I. Toledano-A. Rousso, Engrs.)
SHAKER, AHMED, Alexandria, Egypt (Lecturer, Alexandria Univ.)
SITARAMAN, K., Barkhera (Bhopal State), India (Exec. Engr., Govt. of India)
SOMMA, GEORGE E., White Plains, N. Y. (Asst. Chief Draftsman, Frederick Snare Corp.)
SPANJER, ROY W., Chicago Ill. (Design Engrg., Mid West Concrete Pipe Co.)
VARGA, JOSEPH E., Detroit, Mich. (Instructor, Univ. of Detroit)
WHEAT, D. P., Beaumont, Texas (Partner, Mgr., Transit Mix Concrete & Foundation Co.)
WILHITE, H. ROY, Tulsa, Okla., (Mgr., Waterproofing Dept., Service Lbr. & Hdwe. Co.)
YOAKLEY, P. R., Jacksonville, Fla. (Dist. Mgr., Pittsburgh Testing Lab.)

Corporation

ECONOMY FORMS CORP., Des Moines, Ia. (W. A. Jennings, Pres.)
SOUTHWESTERN ENGRG. & CONSTR. CO., Denver, Colo. (Gene C. Sitter, Pres.)

Junior

BOND, DEREK, Bristol, England (Jr. Engr., Clarke, Nicholls & Marcel)
CHANG, WEN-FA, Houston, Texas (Struct. Design, R. L. Reid)
ELIACHAR, SABY, Oakland, Calif. (Struct. Design, W. Adrian, Leslie Graham, and Wesley Hayes, Struct. Engrs.)
FIRENZE, NORMAN N., Casablanca, Fr. Morocco (Struct. Designer, PUSOM)
MULLANEY, THOMAS A., San Francisco, Calif. (Design, Drafting, Robert D. Dewell, Struct. Engr.)
MULLER, JEAN, New York, N. Y. (Design, Super., Freyssinet Co., Inc.)
NEWBY, FRANK, London, England (Research, Design, F. J. Samuely)
TRYHORN, H. B., Toronto, Canada (Asst. Struct. Field Engr., Can. Natl. Rlys. Bridge Engrs.)
WILLIAMS, J. WAYMAN, JR., St. Louis, Mo. (Salesman, Protective Materials Co.)

Student

BEEN, JOE, Madison, Wis. (Univ. of Wis.)
BERGENDOFF, RAYMOND C., Urbana, Ill. (Univ. of Ill.)
BRENAN, RALPH B., JR., Rothesay Kings Co., Canada (Univ. of N. B.)
FISHER, ROBERT, Berkeley, Calif. (Univ. of Calif.)
HALE, HERBERT C., JR., College Station, Texas (Texas A & M College)
ISBERNER, ALBERT W., Portage, Wis. (Univ. of Wis.)
JOHNSON, CARL B., Brookings, S. D. (S. D. State College)
LANDAU, ROY N., Library, Pa. (Carnegie Inst. of Tech.)
SELLAR DE LA LUZ, SERGIO OSVALDO, Havana, Cuba (Havana Univ.)
MACNAUGHTON, FRANCIS J., Fredericton, Canada (Univ. of N. B.)
MURAKAMI, HIDEO, Manhattan, Kans. (Kans. State College)
MURTHA, JOSEPH P., S. Connellsville, Pa. (Carnegie Inst. of Tech.)
NG, PING KIN, Champaign, Ill. (Univ. of Ill.)
PADOLF S. BRUCE, Pittsburgh, Pa. (Carnegie Inst. of Tech.)
PETH, WILLIAM H., Pittsburgh, Pa. (Carnegie Inst. of Tech.)
SHANBROM, NEWTON, Cambridge, Mass. (MIT)
SHEPHARD, R. STERLING, Fredericton, Canada (Univ. of New Brunswick)
TEMPLETON, ROBERT E., Pittsburgh, Pa. (Carnegie Inst. of Tech.)
VEAL, DONALD, State College Station, S. D. (S. D. State College)
WATSON, ROBERT W., Two Rivers, Wis. (Univ. of Wis.)
WYNNE, BAYARD E., JR., Pittsburgh, Pa. (Carnegie Inst. of Tech.)

Honor Roll

February 1—December 31, 1952

Newlin D. Morgan is still leading the Honor Roll with 39 credits. F. Thomas Collins is second with 15 credits. Howard Simpson is third with 13 credits.

A complete list of all members proposing new applicants for the past year will appear in the March JOURNAL. Will your name be among those helping contribute to the growth of ACI?

Newlin D. Morgan	39
F. Thomas Collins	15
Howard Simpson	13
Ricardo Acosta	12
W. B. Summer	10
C. H. Scholer	9
R. A. Iliya	8
Walter H. Price	7
Theodore O. Reyhner	7
Lawrence L. Schwinn	7
John W. Graham, Jr.	6
Chester P. Siess	6
Henry L. Kennedy	5½
Eddy N. Hernandez	5
T. C. Kavanagh	5
Ira M. Beattie	4
Joseph A. Brunner	4
W. S. Cottingham	4
George C. Ernst	4
Enrique Garcia-Reyes	4
Myle J. Holley, Jr.	4
E. L. Howard	4
Lane Knight	4
Arturo Obadia B.	4
J. L. Savage	4
Emil Schmid	4
G. B. Southworth	4
Miguel Angel Abalo	3
Fred C. Bamman	3
J. R. Cassell	3
A. E. Cummings	3
Albert Goldberg	3
Hunter W. Hanley	3
Samuel Hobbs	3
M. L. Hurst	3
Shu-tien Li	3
Alvin C. Loewer, Jr.	3
Fred F. Loy	3
I. E. Morris	3
K. E. Whitman	3
C. E. Wuerpel	3
Anis Yarid	3
Sterling L. Bugg	2½
Quentin Rust	2½
Jacob Adler	2
A. Amirikian	2
MacGregor S. Anderson	2
Pedro Arismendi A.	2
M. A. Arnold	2
T. Asano	2
Frederick L. Browne	2
D. J. Cameron	2
V. J. Cespedes	2
Frank W. Chappell	2
Francisco J. Cordova	2
Leo H. Corning	2
Charles E. Croom	2
Clayton M. Crosier	2
Raymond E. Davis	2
E. Gaillard Dotterer	2
M. F. DuPont	2
John R. Dwyer	2
Harlan H. Edwards	2
G. E. Elsenhans	2
H. B. Emerson	2
L. G. Farrant	2
Phil M. Ferguson	2
John Jay Fina	2
Russell S. Fling	2
J. R. G. Hanlon	2
John M. Hayes	2
Chuzo Itakura	2
Frank Kerekes	2
M. H. Khalili	2
Frank E. Legg, Jr.	2
T. Y. Lin	2
William E. McBride, Jr.	2
D. M. McCain	2
James A. McCarthy	2
A. J. McElrath	2
John R. Newell	2
Nathan Newmark	2
F. J. Ochoa U.	2
Kiyoshi Okada	2
Dan H. Pletta	2
I. S. Rasmusson	2
Rafael Rodriguez	2
Mills Sampey	2
Saul Shaw	2
James R. Sims	2
Byron D. Spangler	2
Jack N. Sparling	2
Williard H. Stevenson	2
Herbert M. Stoll	2
J. Sumner	2
Anton Tedesko	2
Fred F. Van Atta	2
Calvin Vaudrey	2
John P. Vertrees	2
Ivan M. Viest	2
Jose A. Vila	2
George E. Weingerter	2
Henry Wilckens	2
Robert Zaborowski	2

ARBA annual meeting

The American Road Builders Assn. met February 9-11, 1953, in Boston, Mass. The general sessions consisted primarily of technical presentations under the direction of various ARBA divisions.

Participating divisions were: County and Local Roads Div., Contractors Div., Municipal and Airport Div., Educational Div., Materials and Supplies Div., and the Pan American Div.

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When you call in Raymond, you are turning your foundation work over to an organization which has specialized equipment, supervised by expertly trained men, for handling large, medium and small pile jobs. With 56 years of experience in foundation contract work ranging from a few test piles to more than 40,000 piles for one structure—Raymond has established a record for outstanding service. Your inquiries receive prompt attention.

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Looking up leads of Raymond Universal piledriver while driving precast concrete piles for Morganza (La.) Floodway Control Structure. For this project, Raymond developed two drivers, probably world's tallest with 136-foot leads, to drive 3734 precast piles varying in lengths 80 to 120 feet.

NOW TECHKOTE White Air Meter

...The proven standard in Air Meters offers you this great new

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Designed for:

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- EASY READING
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Techkote Air Meter NOMOGRAPH

This new Nomograph when used with the Techkote Air Meter provides a quick and easy means of determining the Specific Gravity and per cent of Free Moisture of Aggregates as used in the testing and designing of concrete mixes.

Every detail for speed and simplicity of computation has been incorporated into its arrangement.

It is scientifically designed and free of error. In addition, it is protected with a water and acid-proof coating for durability in field and laboratory use. The graph (divided into three sections) covers a range of 1.60 to 6.60 which exceeds the Specific Gravity limits of aggregate as used in the construction industry. Also, the graph covers a range of zero per cent to ten per cent for the determination of free moisture by weight and can be projected to thirteen per cent.

This outstanding new Nomograph together with the Techkote White Air Meter offers a combination unequaled in the field in this type of equipment. ***TO BE SURE...USE THE FINEST!***

TECHKOTE COMPANY

INCORPORATED

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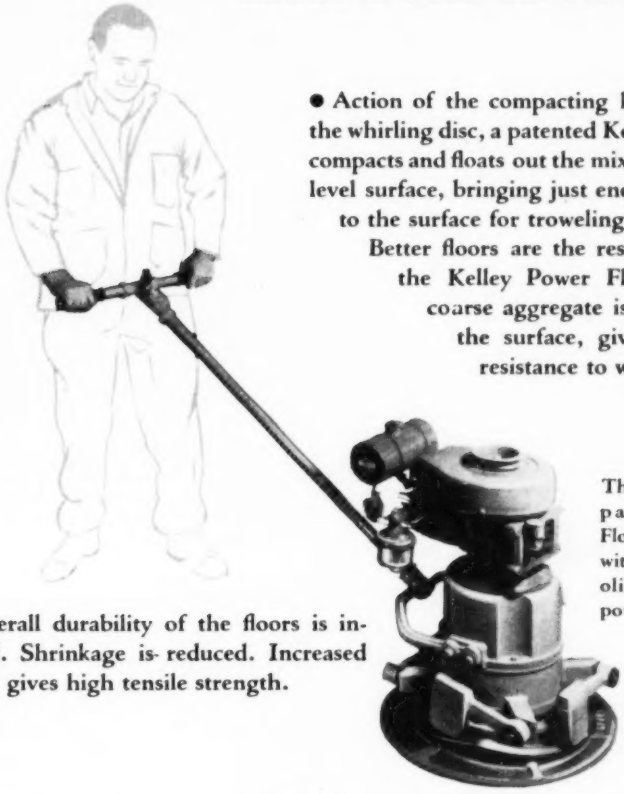
COMPACTOR POWER FLOAT

THE KELLEY COMPACTOR POWER FLOAT PROMOTES EASY WORKABILITY OF RECOMMENDED HARSH, LOW-WATER-CEMENT RATIO MIXES... SPEEDS THE FINISHING OF CONCRETE FLOORS WITH WORTHWHILE SAVINGS IN LABOR AND CEMENT COSTS.



● Action of the compacting hammers on the whirling disc, a patented Kelley feature, compacts and floats out the mix to a smooth level surface, bringing just enough mortar to the surface for troweling.

Better floors are the result of using the Kelley Power Float because coarse aggregate is brought to the surface, giving greater resistance to wear.

The Kelley Compactor Power Float is furnished with either gasoline or electric power head.

Overall durability of the floors is increased. Shrinkage is reduced. Increased density gives high tensile strength.

Write today for "Concrete Facts". This booklet contains proved methods and information by leading authorities.

Kelley

MACHINE DIVISION
THE WIESNER-RAPP CO., INC.
1600 SENECA ST., BUFFALO 10, N.Y.

Continued from p. 20

Public school building will continue its postwar expansion in 1953, responding to constantly growing classroom needs. Expected expenditures for schools represent a ten percent increase over the 1952 total, and the largest amount of classroom space ever to be put in place in a single year.

On the military side, outlays for military and naval facilities will probably rise about one-fifth as considerable new work gets under way—much of it already under contract—and as the extensive current program is completed. A much more moderate rise of three percent will occur in public industrial construction resulting from additions to existing atomic energy facilities and commencement of the huge atomic plant near Portsmouth, Ohio. Construction of industrial facilities for the army, navy, and air force, mostly the rehabilitation of existing ordnance plants, will be substantially completed during 1953.

Public residential building will drop from 1952's level, reflecting tightened statutory limitation on the start of new Federally subsidized housing units. Virtual completion of the Veterans Administration program of hospital construction and reduced funds for the program of Federal aid to state and local hospitals will cause a substantial decline in the rate of publicly-aided hospital building.

Tools, Materials, Services

Under this heading note will be made from time to time of producer literature of presumed technical interest (and available from its source for the asking) to ACI users of tools, equipment, materials, accessories and special services.

Operating heavy-duty trucks safely

National Safety Council has announced a new sound-slide film, "Operating Heavy-Duty Trucks Safely," produced especially for those engaged in hauling operations in quarries and construction. The film shows those who operate and work around heavy trucks the safe practices that will prevent the most frequent and serious accidents. Among the topics covered are safe methods of driving, towing, dumping, riding and getting on and off heavy-duty trucks. —National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Repairing concrete floors

A special quick-setting cement, "Por-Rok," has been developed for repairing chuckholes and breaks in concrete floors and fastening machinery or equipment to concrete by means of anchor bolts. It is used in place of lead and sulfur for most bolt-setting operations. After the hole has been cleaned the powder is mixed with water and is placed around the bolt or into the area to be patched. The cement sets in 15 to 30 min., and patches are ready for light traffic in 15 min. The cement has a compressive strength of 4500 psi and is said to be self-bonding, oil-resistant, and does not shrink.—The Hallemite Mfg. Co., Dept. J-18, 2446 W. 25th St., Cleveland 13, Ohio.

Water treatment

A new development in single-pumping, pressure treatment of water has been announced by Sherwood Water Treatment Co., Inc. Heart of the system is a synchronized "Oxidator" which separates the water into minute particles and at the same time wraps them with free oxygen which "burns" the impurities from the water. The manufacturer states that units are producing clear water from water with over 50 ppm iron and 300 ppm CO_2.—Sherwood Water Treatment Co., Inc., Palmyra, N. J.

Safety films

The foreman's key position in the plant safety program is the theme of two safety films released by the National Safety Council. "Pick Your Safety Target," an all-color cartoon film based on actual accident-reduction plans within industry, features a foreman beset with an accident-ridden department. The film sets forth a three-step plan for detecting accident causes and taking corrective action. The second film, "A Gray Day for O'Grady," employs a series of comedy situations to dramatize the high cost of accidents. "A Gray Day for O'Grady" is available in 35 mm sound-slide film and 16 mm sound motion picture, both in black and white. "Pick Your Safety Target" is available in 35 mm colored sound slides and 16 mm sound motion picture in both color and black and white.—National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Pallet rollers

Pallet rollers for moving a loaded pallet in two directions, forward or backward, are described in Bulletin 102-K issued by the Frank L. Robinson Co. The large diameter heavy gage rolls have crowned ends for free rolling and floor protection. Bearings are heavy duty and the frame is constructed of high tensile strength steel. The equalizer design is said to retain parallelism and alignment of the frame under all conditions.—Frank L. Robinson Co., Latham Square Bldg., Oakland 12, Calif.

Resistance thermometer

Weiller Instruments Corp. has announced the Universal speed bridge, Type BU-1000, which is intended to indicate temperatures to 0.001 C over restricted ranges. It is provided with a 1000 division, 10-turn slide wire. New bridge arms can be plugged in to change the range. The significant bridge arms are located under a hood with a heater and thermostat to keep them at the same temperature. Power supply is 115 volts, 60 cycles a-c.—Weiller Instruments Corp., 95 Broad St., New York 4, N. Y.

Colored concrete

Another use for colored concrete has been proposed by Reardon Industries, Inc. It is proposed that the color would be mixed with concrete which is used to encase lines carrying electrical conduits, brines, acids, alcohols, petroleums, and other liquids, to identify the lines. The "color identification" concrete has already been used in the repair of a dam in West Virginia to gage the placing of new concrete under the old dam. As the new concrete came through, the completeness of its entry under the old dam was determined by the red color of the new concrete.—Reardon Industries, Inc., 2837 Stanton Ave., Walnut Hills, Cincinnati 6, Ohio

Vermiculite-sand concrete

Zonolite Co. has published an illustrated brochure, "Floor-Slabs and Floor-Fill," which describes the properties of vermiculite-sand concrete and contains specifications for its use. Weighing only about one-half as much as ordinary sand concrete and said to possess four and one-half times as much insulating value, the vermiculite-sand mixture is employed in grade level floors, as a fill over structural floors, and for floor slabs over closely-spaced joists.—Zonolite Co., 135 S. LaSalle St., Chicago 3, Ill.

Color coating for masonry

A rubber-based masonry paint in various colors has been announced by Sapolin Paints, Inc. Sapolin Mason-Dri is said to seal masonry surfaces against moisture and freezing and it is claimed it allows a surface to breathe sufficiently to permit the escape of excessive moisture. It can be applied by brush, roller, or spray.—Sapolin Paints, Inc., 229 E. 42nd St., New York, N. Y.

Concrete forms

Masonite Corp. has announced an addition to its line of concrete form Presdwood. Known as Masonite Presdply, the 4 x 8-ft panels have a core of plywood and faces of specially tempered Presdwood. The panels are said to combine the surface characteristics of Presdwood—hardness, smooth grainless surface, strength, and moisture resistance—and the structural qualities of the thicker plywoods. Presdply panels come in thicknesses of $\frac{5}{8}$ and $\frac{3}{4}$ in.—Masonite Corp., Box 777, Chicago 90, Ill.

Tubular frame conveyors

E. F. Marsh Engineering Co. has published a new bulletin, SF-1, on Marco standard tubular frame conveyors. The bulletin illustrates typical job applications and presents general specifications of the various types of conveyors available.—E. F. Marsh Engineering Co., 4030 Chouteau Ave., St. Louis 10, Mo.

Electrically heated screen cloth

A method of heating screen cloth by electricity to prevent clogging or "blinding" when wet materials are screened has been announced by Hewitt-Robins Inc. Electrical current is carried to the screen by short insulated cables attached to copper bars which are under the screen cloth and make direct contact with it. The new electrical arrangement is said to eliminate power losses encountered in older systems where current is passed through steel or copper skirtboards alongside the screen and above the screen cloth. The current distribution bars are shielded from abrasive action of material being screened, thus preventing weak or broken contacts due to corrosion of steel or copper parts.

Current going into the screen cloth is regulated by a Hannon variable step screen cloth heater. Voltages range between 5 and 15 volts and amperes from 1000 up to 4000. The heated screen cloth dries out and bakes wet clay, stone or other material as it tends to build up on the screen cloth wires. This causes it to flake off instead of "blinding" the openings. The automatic cleaning speeds up the processing of wet materials, assures efficient sizing and prevents screen cloth wear resulting from "beating" or other manual cleaning methods.—Hewitt-Robins Inc., 666 Glenbrook Rd., Stamford, Conn.

Membership certificates

Repeated but infrequent requests for membership certificates indicate that enough members may want them to warrant having them made. At its fall meeting, the Board of Direction authorized the Secretary to determine through this notice whether or not the Institute would be justified in going to the expense of having the necessary work done.

It is estimated that certificates suitable for framing can be furnished ACI Members at a cost of not over $3.50. Those interested are requested to clip the attached coupon and mail it to Institute headquarters. *Please do not send money until billed.*. If there are not enough interested, the Institute would not be justified in supplying certificates to a few at a loss.

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Detroit 19, Mich.

Gentlemen: Please place an order for one membership certificate to be furnished provided enough members buy them to make it worthwhile at a cost not to exceed $3.50.

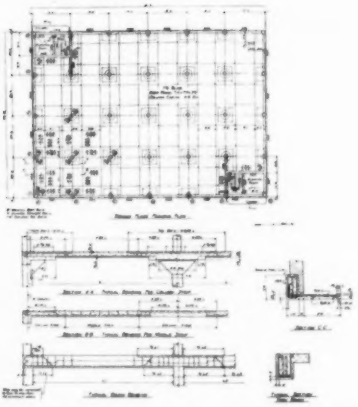
Signed.....

Manual of Standard Practice for Detailing Reinforced Concrete Structures

(ACI Standard 315-51)

for the

Designer
Detailer and
Student



$3.00 (to ACI Members—$1.75)

Completely revised to include new-style A-305 deformed reinforcing bars, higher bond values permitted by the ACI Building Code, other changes to conform more closely to the ACI Code, and editorial changes for greater clarity.

The fundamental purpose of all "engineering drawings" is to enable the builder to transform the designer's calculations and design into the structure he has conceived. These drawings give the information necessary for building forms and placing concrete and for preparing the "placing drawings" (sometimes called "detail drawings") which must contain the information necessary for fabricating the reinforcement and placing it in the forms.

The **Manual** illustrates typical engineering and placing drawings prepared according to the standards. The designs are not intended as standard designs, although in general they meet the requirements of the American Concrete Institute's "Building Code Requirements for Reinforced Concrete" (ACI Code). They are intended to show **standard detailing methods.**

American Concrete Institute **18263 W. McNichols Rd.** **Detroit 19, Mich.**

The Detailing Manual includes—

Drawing standards—Standards and comments on size of sheet, layout, scales and symbols.

Marks—Discussion of systems of marking members and reinforcement.

Schedules—Discussion of types of schedules and recommendations for their use.

Engineering drawings—Information required on drawings and best methods of showing it.

Placing drawings—Best methods of showing necessary information.

Fabricating detail standards—Standards for bending, hooks, stirrups, typical bar bends, slant lengths, beam widths, spirals, ties, column verticals, splices and dowels.

Notes to designers and detailers—Attention is called to points which frequently are overlooked or which cause trouble. Conformance with the suggestions given eliminate most difficulties of interpretation, fabrication and construction.

Shop procedure—Brief description of steps in the shop.

Warehouse stock—Notes material usually carried in stock.

Tolerances—Standard tolerances in dimensions of fabricated reinforcement.

Extras—Basis for extra charges for material and fabrication.

Welded wire fabric—Data on fabrication, size limitations, detailing and common styles.

Accessories—Standard accessories and their use.

Typical drawings—21 typical engineering and placing drawings are shown for various structures to illustrate the use of the standards and methods advocated in the manual. A short discussion of the important points accompanies each drawing.

Typical drawings

The engineering drawings used in the manual were selected from plans of actual structures but have been modified in some details to conform more closely with the ACI Code and to illustrate recommended methods of presenting the information. Shop prepared placing drawings accompany each engineering drawing.

- Concrete joist floor
- Flat slab floor
- Beam and girder floor
- Two-way slab and beam floor
- Foundations
- Columns
- Architectural concrete building
- Wall details
- Stair details
- Circular tank
- Rigid frame bridge

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Discussion closed January 1, 1953

Sept. Jl. '52

Some Effects of Vibration and Handling on Concrete Containing Entrained Air—Elmo C. Higginson

Cement Mortar Pipe Linings—J. Wright Taussig

Field Practice in Lightweight Concrete—John A. Murlin and Cedric Willson

Use of Concrete in Residential Construction—C. O. Christenson

Practical Design of Thin Retaining-Wall Footings—R. P. V. Marquardsen

Discussion closed February 1, 1953

Oct. Jl. '52

Analysis of Beam-and-Girder Framing with Known Column Settlements—Phil M. Ferguson

Proposed Definitions and Notations for Prestressed Concrete—Joint ACI-ASCE Committee 323

Effect of Compressive Reinforcement on the Plastic Flow of Reinforced Concrete Beams—G. W. Washa and P. G. Fluck

Heavy Duty Concrete Floors—E. E. Eckert

Inelastic Behavior in Tests of Eccentrically Loaded Short Reinforced Concrete Columns—Eivind Hognestad

Instrumentation and Strain Measurement in Welded Wire Fabric Reinforced Concrete Slabs—E. W. Carlton and J. H. Senne